

REMARKS

This application contains claims 1, 3, 5-19 and 21-33. Claims 20 and 34-51 were withdrawn in response to a restriction requirement. Claims 23-33 are hereby canceled. Claim 1 has been amended. No new matter has been introduced. Reconsideration is respectfully requested.

Applicant thanks Examiner Hassanzadeh for the courtesy of an interview granted to applicant's representative, Sanford T. Colb (Reg. No. 26,856) in the USPTO on July 1, 2003. The substance of the interview is described in the Interview Summary prepared by the Examiner.

Claims 1, 3, 5-11, 21 and 22 were rejected under 35 U.S.C. 103(a) over Maekawa (EP-0,764,478-A1) in view of Engelsberg et al. (U.S. 5,531,857) and Vaught (U.S. 5,023,424), while claims 12-18 were rejected under 35 U.S.C. 103(a) over these references and further in view of Allen (U.S. 4,987,286). Maekawa describes a method and apparatus for cleaning a semiconductor substrate, using a swing arm to move a rotatable cleaning unit over the substrate (col. 5, lines 1-8). The cleaning unit includes a cleaning member, which is used, for example, to scrub the surface of the substrate while a nozzle ejects a cleaning liquid onto the surface (col. 5, lines 24-29, and col. 6, lines 2-4). Engelsberg, Allen and Vaught all describe methods and apparatus for removing contaminants from a surface using high-intensity radiation. Vaught, in addition, describes the use of a particle position detector to locate the position of particles on a wafer (col. 3, lines 55-57). After detection of the particles in a particle detector station, the wafer is transported to a particle removal station for cleaning (col. 3, lines 47-50).

Applicant has amended claim 1 in order to more clearly distinguish the present invention over the cited art. The amended claim recites an arrangement wherein a chuck is used to position a substrate within a processing chamber for scanning by a particle localization unit. The same chuck, in the same chamber, is used to position the substrate with respect to an optical arm so that a beam of energy is directed by the arm to impinge on particle locations determined by the

localization unit. As discussed in the interview, the amended claim has been restated so as to clarify the structural interrelations between the elements of the claim.

The novel combination of amended claim 1 is neither disclosed nor suggested by the prior art. Although Vaught describes the use of a particle detector in conjunction with a laser-based particle removal station, these two elements are clearly separate units, as noted above. (See also Vaught's Fig. 1 and col. 6, lines 31-38.) Although Engelsberg and Maekawa mention the use of "arms" in applying cleaning processes, neither of them makes any suggestion that such arms could be used in a directed, localized process, as required by claim 1, let alone performing their cleaning processes in the same chamber. None of these references teach or suggest the use of the same chuck for both particle detection and radiation-based particle removal. Although Maurer (U.S. Patent 5,634,230, made of record by the Examiner, but not relied upon) describes apparatus that includes both an inspection device and a probe for removing contaminants, the probe clearly does not apply either radiation or process gases to remove the contaminants.

Thus, applicant respectfully submits that claim 1 is patentable over the cited art. In view of the patentability of claim 1, claims 3, 5-19, 21 and 22, which depend from claim 1, are believed to be patentable, as well.

With regard to claim 19, in the previous Official Action, the Examiner indicated that claims 19 and 20 were withdrawn from consideration as being drawn to a nonelected species. Applicant pointed out in the previous amendment, however, that only claim 20 is drawn to the nonelected species (species 2). The species of claim 19 (species 1) was elected for further prosecution in applicant's Preliminary Amendment and Response, submitted July 16, 2002. The Examiner appears to have disregarded this point in the present Official Action, and has therefore continued to treat claim 19 as having been withdrawn. The Examiner is now requested to cancel his withdrawal of claim 19 and to examine this claim in the next substantive action.

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Claims 23-26 and 30 were rejected under 35 U.S.C. 102(b) over Engelsberg (U.S. Patent 5,821,175), while claims 27-29 and 31-33 were rejected under 35 U.S.C. 103(a) over Engelsberg in view of Vaught or in view of Allen. These claims have been canceled.

Applicant has studied the additional prior art cited by the Examiner, and believes that the claims currently pending in the present patent application are patentable over this additional prior art, as well, whether taken alone or in combination with other references.

Applicant believes the amendments and remarks presented hereinabove to be fully responsive to all of the grounds of rejection and objections raised by the examiner. In view of these amendments and remarks, applicant respectfully submits that all of the claims in the present application are in order for allowance. Notice to this effect is hereby requested.

Respectfully submitted,

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